

## STERILIZING AIR FILTER

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to an air filter, and more particularly to an air filter for sterilizing and filtering the air.

#### 2. Description of Related Art

Some infecting microbes, e.g. influenza virus, corona virus, parainfluenza virus, are spread into the atmosphere by sneezing and vomiting of patients. When people are in enclosed spaces, healthy people may become infected through the ventilation system, such as an air conditioner unit. At this time, people must wear respirators for preventing such infection. If any method or device can sterilize or filter the air to eliminate the infected microbes, people may feel relieved that they do not need to wear respirators. A conventional method for sterilizing microbes is using 70 % ethanol in a sprayer to sterilize the desired place, e.g. a table, hand or container. However, the sprayer must be manually operated and no automatic machine can filter the air as well as spray disinfectant to the air.

### SUMMARY OF THE INVENTION

The main objective of the present invention is to provide an automatic sterilizing air filter that can sterilize and filtrate microbes and spray disinfectant in the air.

To achieve the objective, a sterilizing air filter in accordance with the present invention comprises a casing, a base, multiple spray devices, a cover, multiple fans and multiple bent tubes. The casing has an inlet and an outlet. The

1 base is mounted in the casing and has multiple chambers in the base. The  
2 disinfectant can be poured into the chambers. The spray devices respectively  
3 mounted in the chambers and the cover fitted on the base are used for spraying  
4 disinfectant in the air of the chamber. The multiple fans are mounted in the cover  
5 and the multiple bent tubes are mounted with the cover and correspond to the  
6 inlet or the outlet in the casing for spreading the sprayed disinfectant between the  
7 different chambers and out to the air. The sterilizing air filter not only sucks the  
8 air into the sterilizing air filter for sterilization and filtration but also  
9 automatically sprays the disinfectant out to the air to kill microbes in the air.

10 Further benefits and advantages of the present invention will become  
11 apparent after a careful reading of the detailed description with appropriate  
12 reference to the accompanying drawings.

### 13 BRIEF DESCRIPTION OF THE DRAWINGS

14 Fig. 1 is a perspective view of a sterilizing air filter in accordance with  
15 the present invention;

16 Fig. 2 is a perspective view of an internal part of the sterilizing air filter  
17 in Fig. 1;

18 Fig. 3 is an exploded perspective view of the sterilizing air filter in Fig.  
19 1;

20 Fig. 4 is a top plane view of multiple tubes of the sterilizing air filter in  
21 Fig. 1; and

22 Fig. 5 is a side plane view of the sterilizing air filter in Fig. 1.

### 23 DETAILED DESCRIPTION OF THE INVENTION

24 With reference to Figs. 1 to 3, a sterilizing air filter in accordance with

1 the present invention comprises a casing (10), a base (20), multiple spray devices  
2 (30), a cover (40), multiple fans (50) and multiple bending tubes (60).

3 The casing (10) has a top (not numbered), a bottom (not numbered), a  
4 sidewall (not numbered), an optional opening (not shown), an optional plate (16),  
5 an inlet (12) and an outlet (14). In a preferred embodiment, the inlet (12) is  
6 formed through the sidewall and the outlet (14) is formed through the top. The  
7 optional opening is formed in the sidewall and the plate (16) covers the opening.

8 The base (20) is mounted in the casing (10) and has multiple chambers  
9 (22) defined in the base (20). In a preferred embodiment of the present invention,  
10 the base (20) has two chambers (22) named first chamber (not numbered) and  
11 second chamber (not numbered).

12 The multiple spray devices (30) are respectively mounted in the  
13 chambers (22) and each has an electric pump (32), a flat filter (34) and an  
14 optional spray head (36). The electric pump (32) is mounted in the  
15 corresponding chamber (22) and has a top (not numbered). The flat filter (34) is  
16 mounted on the top of the electric pump (32). In a preferred embodiment of the  
17 present invention, the optional spray head (36) is mounted on the flat filter (34)  
18 and connected with the top of the electric pump (32). In a preferred embodiment  
19 of the present invention, the microbial filter has two spray devices (30) and one  
20 is mounted in the first chamber (22) and the other is mounted in the second  
21 chamber (22).

22 The cover (40) is fitted on the base (20) and has a plate (42), multiple  
23 holes (44), multiple connecting tubes (45), multiple optional setting tubes (43)  
24 and multiple tubular filters (46). The plate (42) is mounted on the base (20). The

1 holes (44) are formed in the plate (42) and each has a periphery (not numbered).  
2 In a preferred embodiment of the present invention, the cover (40) has four holes  
3 (44). Two holes (44) are corresponded with the first chamber (22) of the base (20)  
4 and the other two holes (44) are corresponded with the second chamber (22) of  
5 the base (20). The multiple connecting tubes (45) are formed integrally and  
6 extend upward from the plate (42) and the periphery of the corresponding hole  
7 (44). The multiple tubular filters (46) each have a proximal end (not numbered)  
8 and a distal end (not numbered). The proximal end of the tubular filter (46) is  
9 connected around the periphery of the corresponding hole (44). The distal end of  
10 the tubular filter (46) is mounted around the corresponding spray device (30) in  
11 the chamber (22) of the base (20). In a preferred embodiment of the present  
12 invention, the tubular filters (46) are connected with one of the two holes  
13 corresponded with the same chamber (22) of the base (20). The optional setting  
14 tubes (43) are formed integrally with and extend downward from the plate (42)  
15 and the periphery of the corresponding holes (44). The multiple tubular filters  
16 (46) are preferably mounted around the corresponding setting tube (43).

17 The multiple fans (50) are respectively mounted in the connecting tubes  
18 (45).

19 The multiple bent tubes (60) are mounted with the connecting tubes (45)  
20 on the plate (42) of the cover (40) and correspond to the inlet (12) in the casing  
21 (10) or the outlet (14) in the casing (10). In a preferred embodiment of the  
22 present invention, the sterilizing air filter has three bent tubes (60) respectively  
23 named first bent tube (62), second bent tube (64) and third bent tube (66). The  
24 first bent tube (62) has a proximal end (not numbered) and a distal end (not

1 numbered). The proximal end of the first bent tube (62) is connected with the  
2 connecting tube (45) that has the tubular filter (46) mounted corresponding to the  
3 first chamber (22) of the base (20). The distal end of the first bent tube (62) is  
4 mounted corresponding to the inlet (12) in the casing (10). The second bent tube  
5 (64) has a proximal end (not numbered) and a distal end (not numbered). The  
6 proximal end of the second bent tube (64) is connected with the connecting tube  
7 (45) that has no tubular filter (46) mounted corresponding to the first chamber  
8 (22). The distal end of the second bent tube (64) is connected with the connecting  
9 tube (45) that has the tubular filter (46) mounted corresponding to the second  
10 chamber (22). The third bent tube (66) has a proximal end (not numbered) and a  
11 distal end (not numbered). The proximal end of the third bent tube (66) is  
12 connected with the connecting tube (45) that has no tubular filter (46) mounted  
13 corresponding to the second chamber (22). The distal end of the third bent tube  
14 (66) is mounted corresponding to the outlet (14) in the casing (10).

15         With further reference to Figs. 4 to 5, the disinfectant that can be  
16 directed against specific microbes is poured into the base (20). The disinfectant  
17 is pumped upward by the electric pump (32) to the top of the electric pump (32)  
18 and preferably sprayed from the spray head (36) to the flat filter (34). The  
19 sprayed disinfectant flows down and through of the tubular filter (46). The fan  
20 (50) corresponded with the first bent tube (62) lets the air flow from the inlet (12)  
21 in the casing (10) and blows the sprayed disinfectant through of the flat filter (34)  
22 and the tubular filter (46). The fan (50) corresponded with the second bent tube  
23 (64) lets the air with the sprayed disinfectant flow out to the second chamber (22)  
24 of the base (20). The electric pump (32) in the second chamber (22) also pumps

1 the disinfectant to the flat filter (34) and the tubular filter (46). The fan (50)  
2 connected correspondingly to the distal end of the second bent tube (64) lets the  
3 air with the sprayed disinfectant in the first chamber (22) blow the disinfectant  
4 through of the flat filter (34) and the tubular filter (46) in the second chamber (22)  
5 to spray the disinfectant. The fan (50) connected corresponding to the proximal  
6 end of the third bent tube (66) lets the air with the sprayed disinfectant flow out  
7 from the outlet (14) in the casing (10).

8           The sterilizing air filter not only sucks the air into the microbial filter for  
9 sterilization and filtration but also automatically sprays the disinfectant out to the  
10 air to kill microbes in the air.

11           Although the invention has been explained in relation to its preferred  
12 embodiment, many other possible modifications and variations can be made  
13 without departing from the spirit and scope of the invention as hereinafter  
14 claimed.